

CLAIMS

What is claimed is:

1. An auxiliary gearbox of a transmission comprising:

a piston housing having a first bore and a second bore;

a first piston arranged within said first bore separating first and second chambers within said first bore, a first shaft extending from said first piston and connected to a first shift fork for selectively engaging a first auxiliary gear in response to actuation of said first piston;

a second piston arranged within said second bore separating third and fourth chambers within said second bore, a second shaft extending from said second piston and connected to a second shift fork for selectively engaging a second auxiliary gear in response to actuation of said second piston; and

first, second, third actuators for selectively actuating said pistons, said first actuator fluidly connected to said first chamber, said second actuator fluidly connected to said second and fourth chambers, and said third actuator fluidly connected to said third chamber.

2. The auxiliary gearbox of claim 1, wherein said actuators are solenoids supported on said piston housing.

3. The auxiliary gearbox of claim 2, wherein said solenoids selectively provide pressurized fluid to said chambers.

4. The auxiliary gearbox of claim 1, wherein said first and second shafts extend from said pistons respectively into said second and fourth chambers.

5. The auxiliary gearbox of claim 1, wherein said actuators include on and off states, a first gear set defined by said first and third actuator in said off state and said second actuator in said on state, a second gear set defined by said first actuator in said off state and said second and third actuators in said on state, and a third gear set defined by said first and third actuators in said on state and said second actuator in said off state.

6. The auxiliary gearbox of claim 1, wherein said chambers include pressurized and unpressurized states; a first gear set defined by said second and fourth chambers in pressurized states and said first and third chamber in unpressurized states; a second gear set defined by said first chamber in said unpressurized state and said first, second, and fourth chambers in said pressurized states; and a third gear set defined by said first and third chambers in said pressurized states and said second and fourth chambers in said unpressurized states.

7. The auxiliary gearbox of claim 1, wherein a desired gear set is obtained by pressurizing three of said chambers.

8. A method of shift a gear in an auxiliary gearbox comprising the steps of:

- a) providing a housing having a bore with a piston arranged within the bore, the piston separating the bore into first and second chambers with a shift shaft extending from the piston into the second chamber;
- b) pressurizing one of the chambers;
- c) pressurizing the other of the chambers subsequent to performing step b) with the one of the chambers still pressurized; and
- d) moving the piston to obtain a desired gear set subsequent to performing step c).

9. The method of claim 8, wherein step b) includes actuating a first solenoid and step c) includes actuating a second solenoid.

10. The method of claim 8, wherein a first force generated in the first chamber is greater than a second force generated in a the second chamber subsequent to performing step c).